

# **Managing Energy demand**

## **The key to a sustainable future**

**Efficiency, life-styles and technological opportunities**

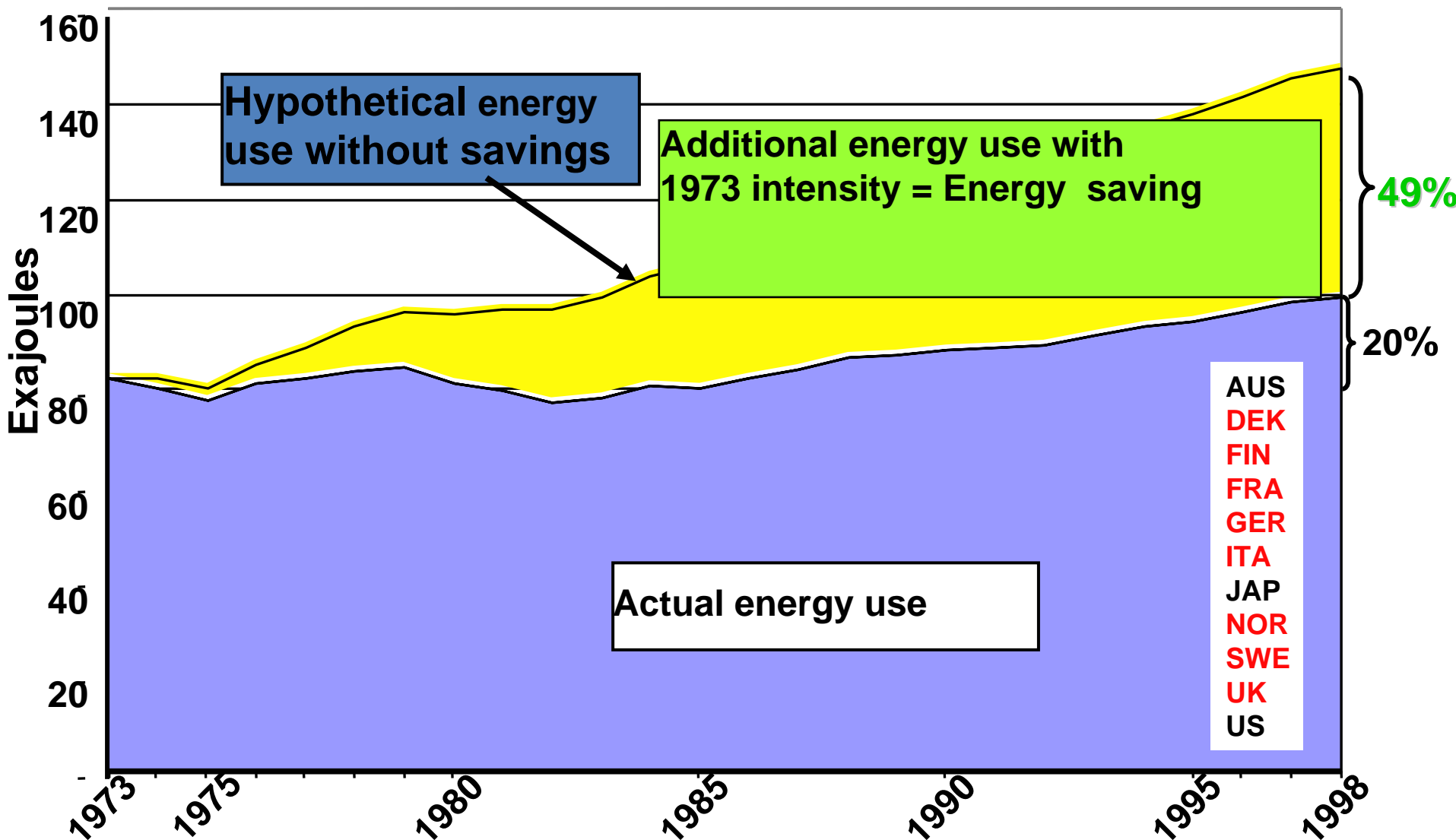
Hans Nilsson

Chairman of the IEA DSM-Programme

FourFact AB

[www.fourfact.com](http://www.fourfact.com)

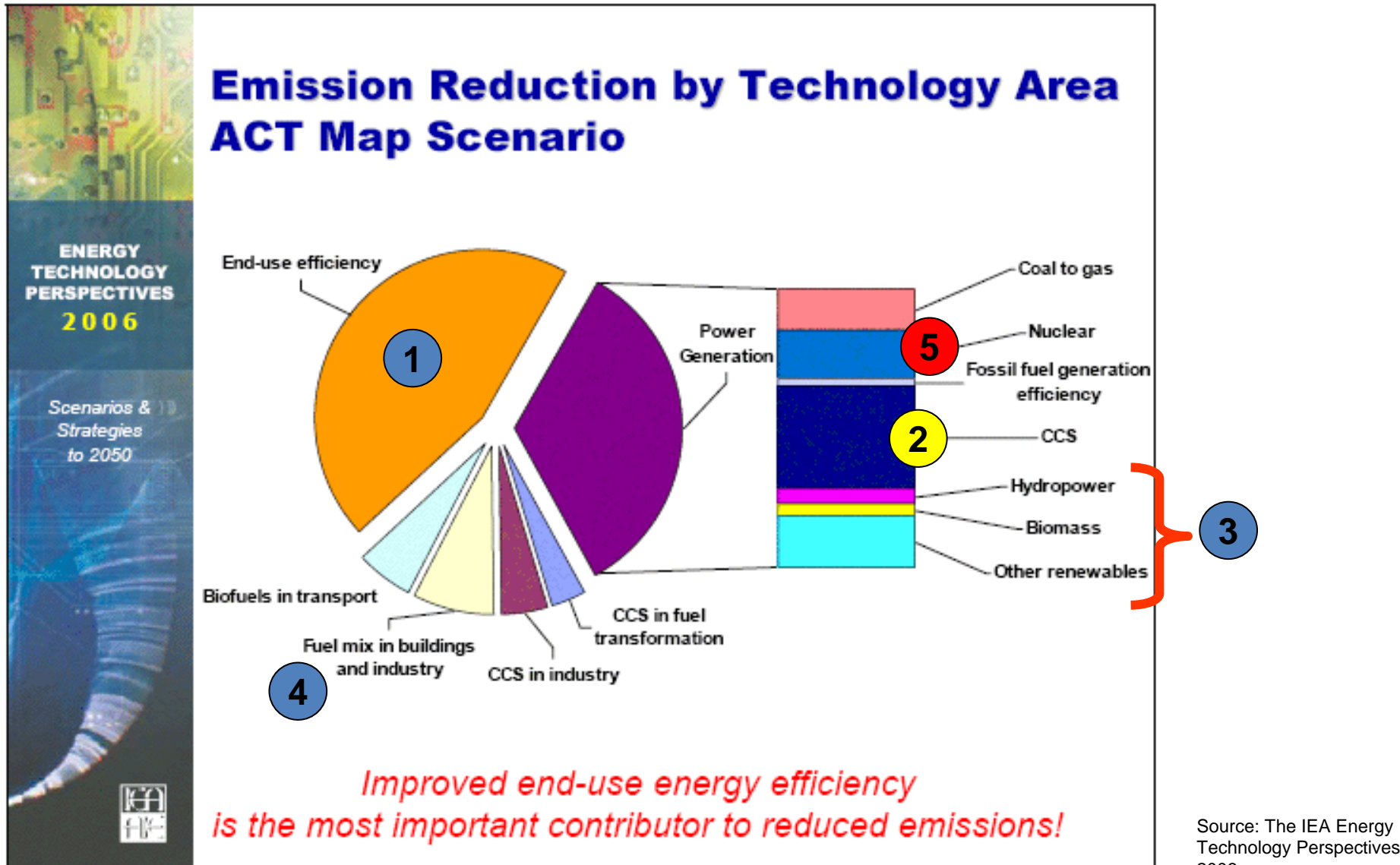
# Energy-use in the IEA-11



The rise in welfare depends more on energy efficiency improvements than on growth in energy use!



# Energy efficiency – The most important means to reduce GHG

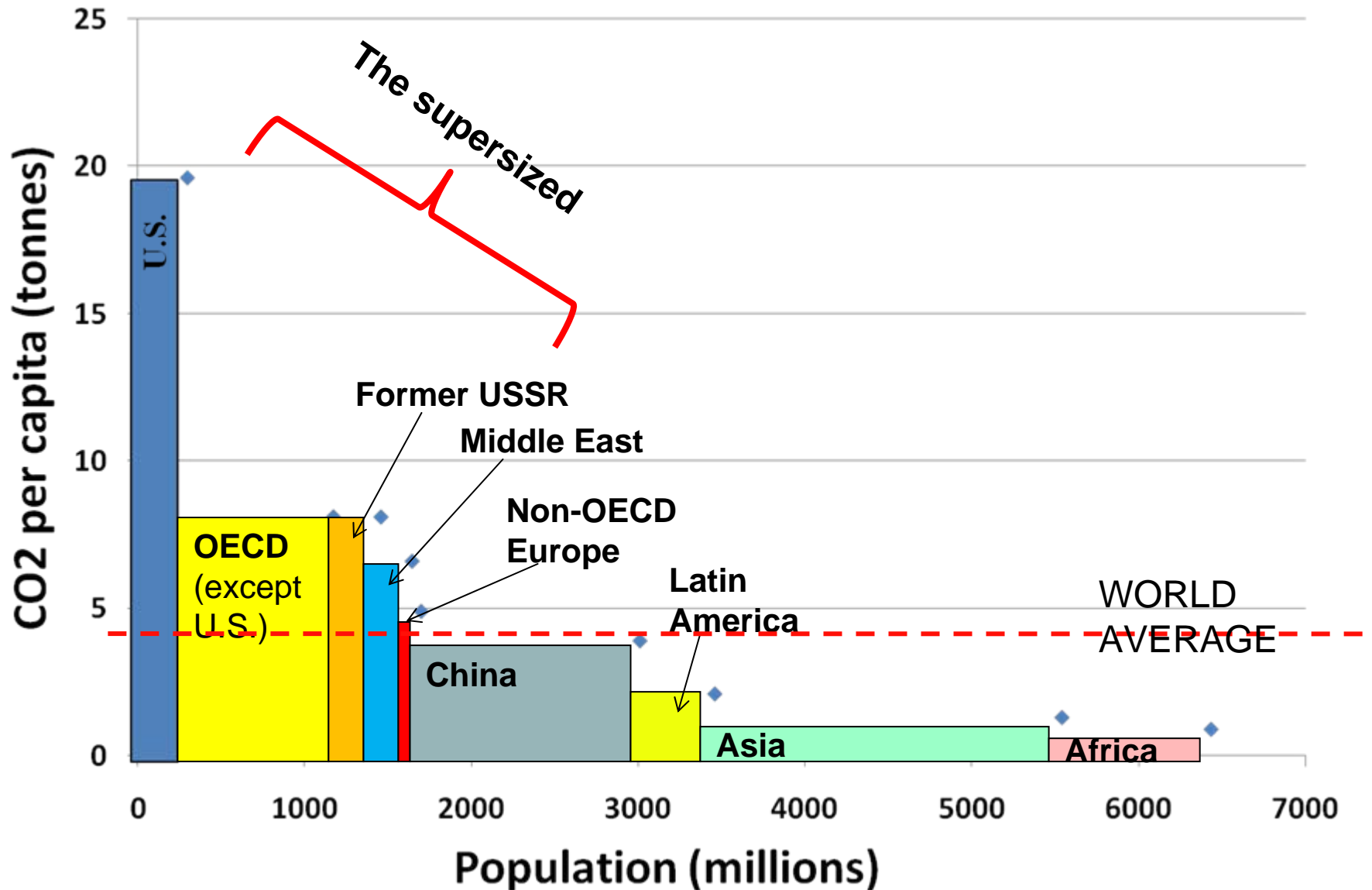


# Let us use the efficiency improvements wisely

- The ASI-formula
- Energy Use = **Activity**\*  
**Structure**\*  
**Intensity**
- Can we harvest the intensity improvements in full?
- Do we need more (activity) or bigger (structure) improvements?

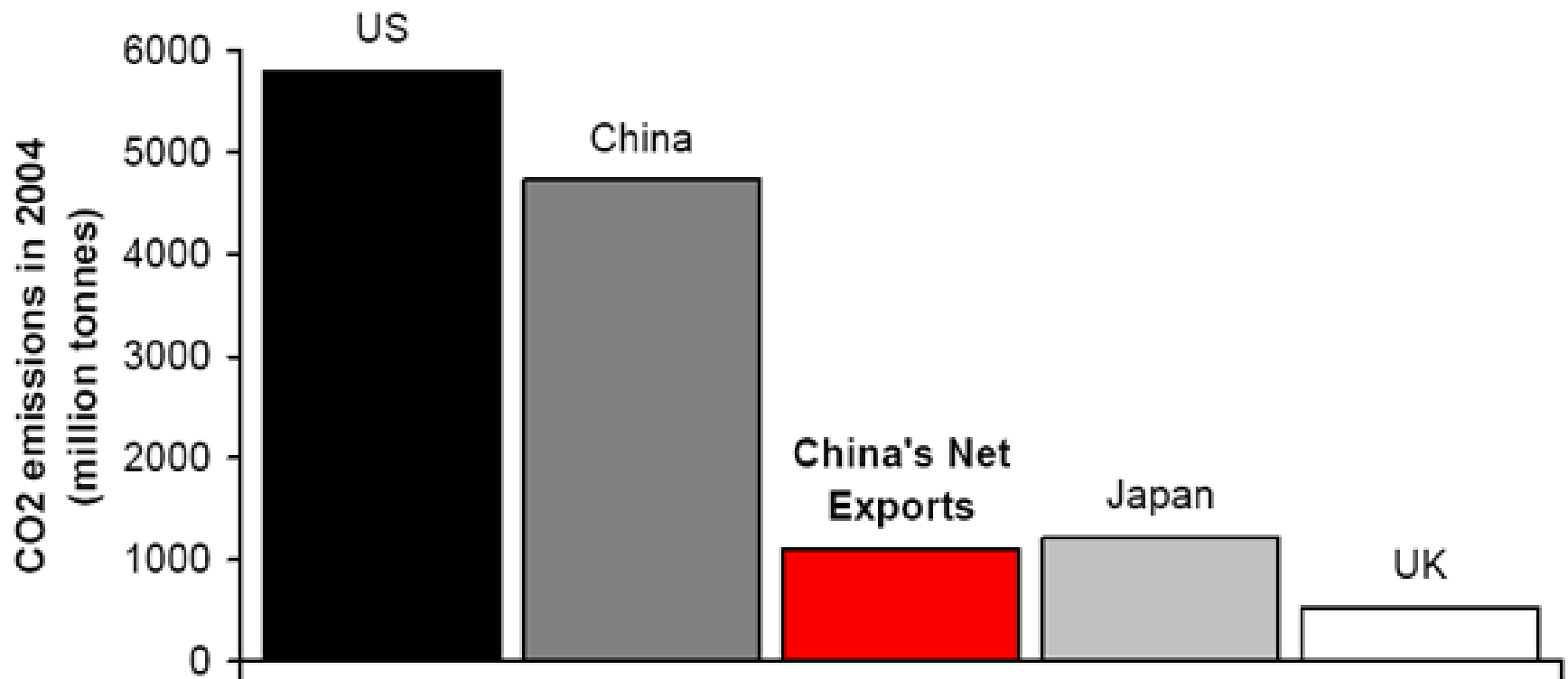


# CO2-emissions in the world

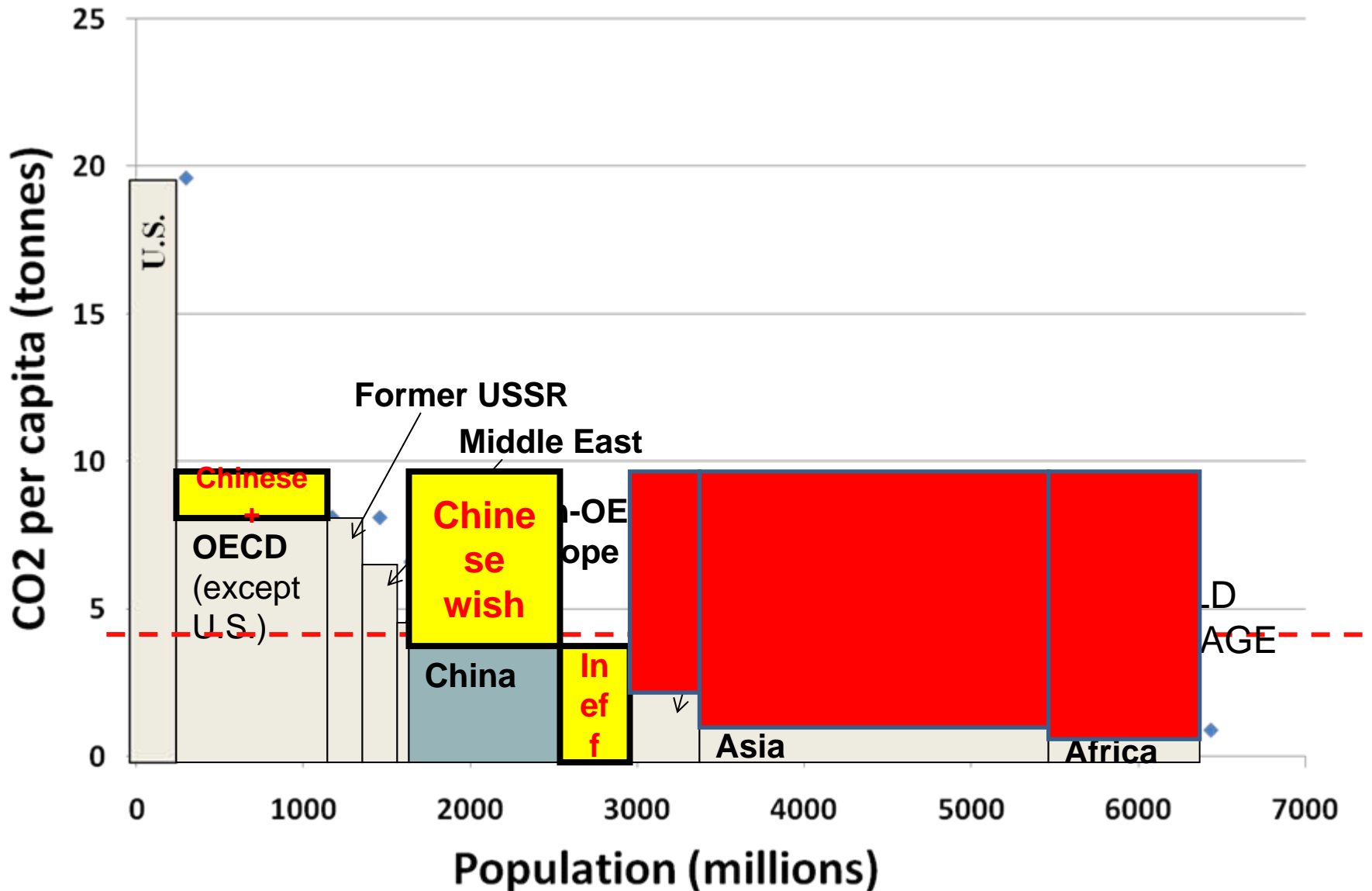


# Part of the Chinese CO<sub>2</sub> is ours!

Graph. CO<sub>2</sub> emissions from China's net exports in 2004 in comparison to other countries total emissions. China exceeded USA emissions in 2006



# CO2-emissions in the world

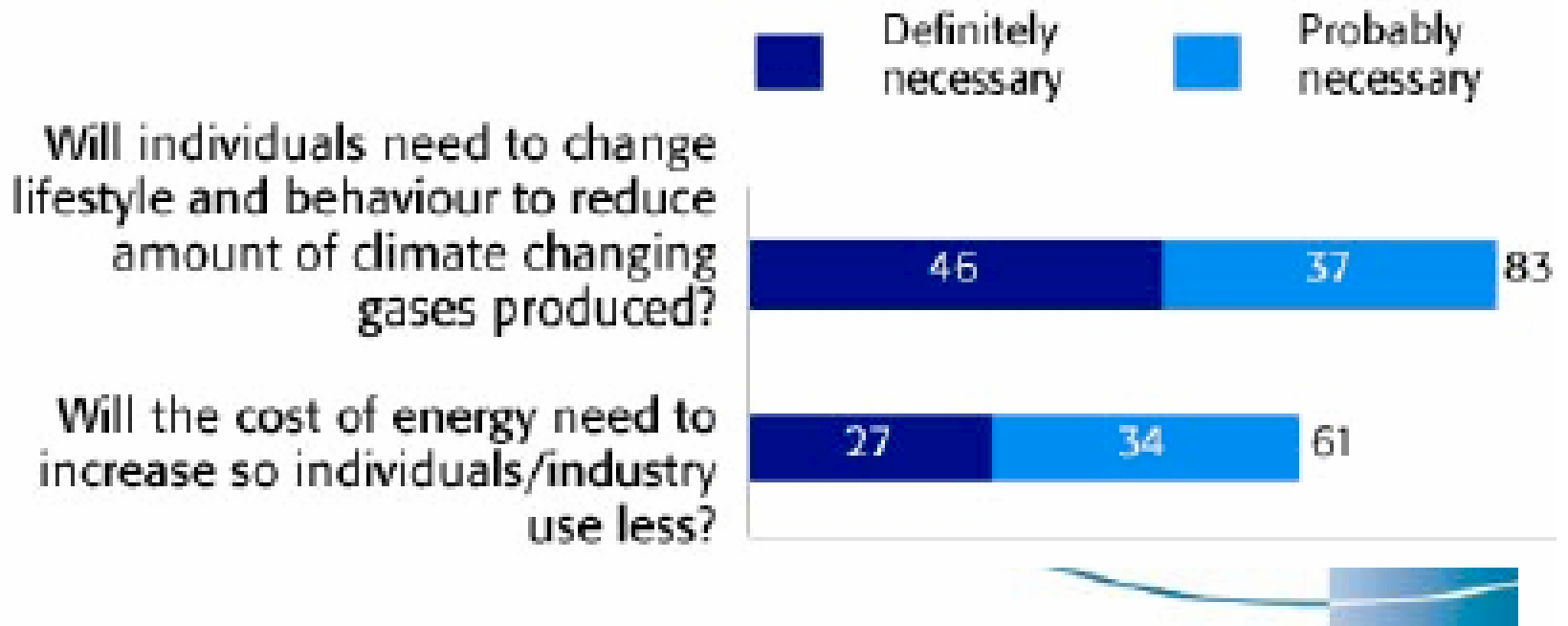




# Does climate change concern you?

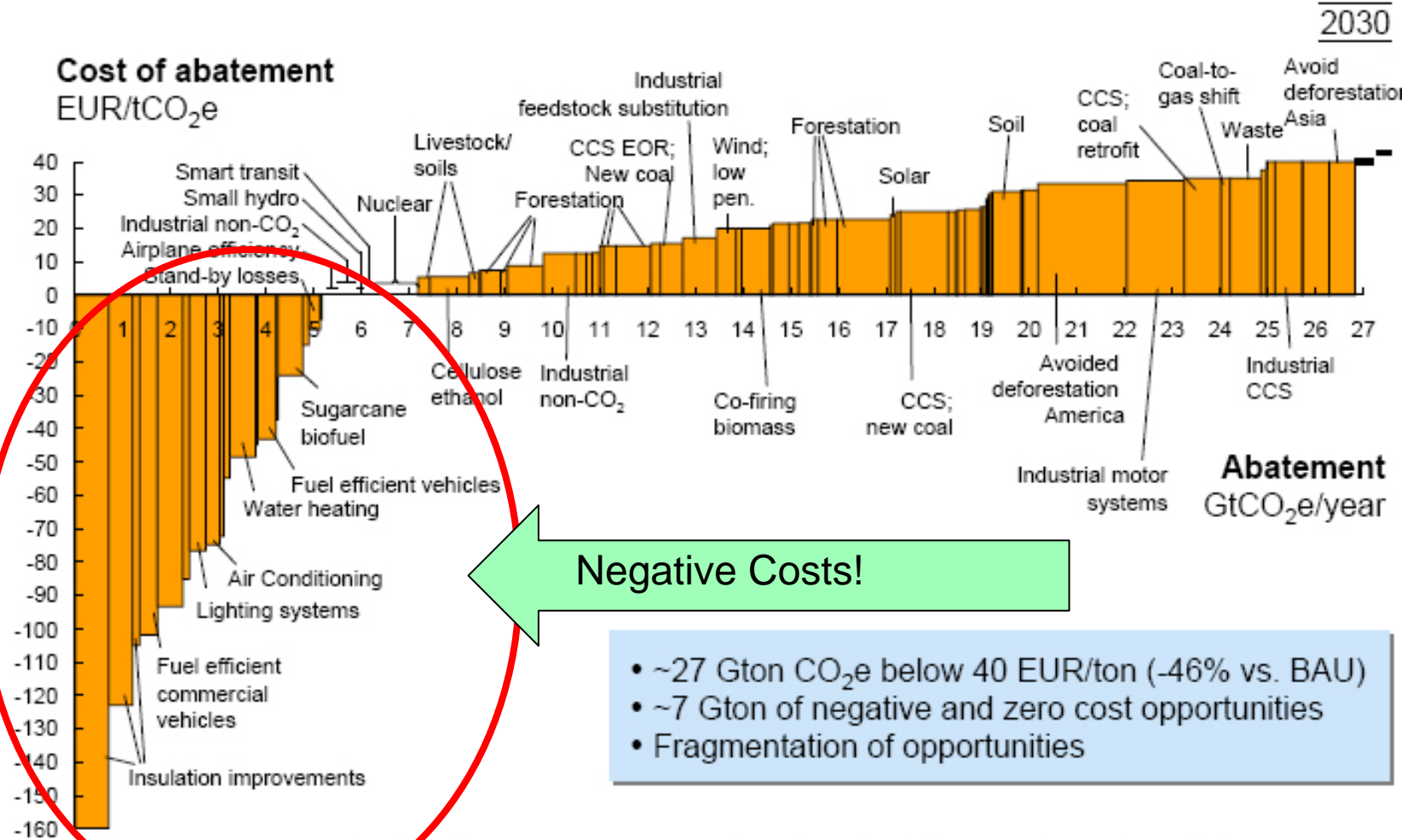
## Required Action on Climate Change

Percent Saying "Necessary," Average of 21 Countries, 2007



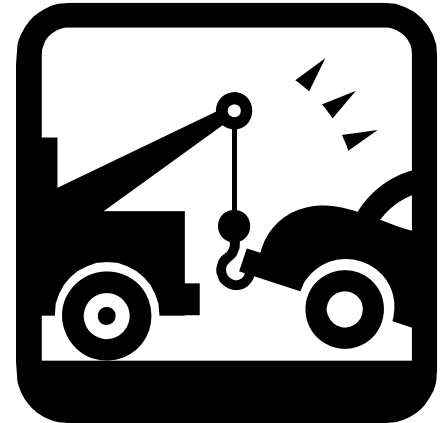
# Energy Efficiency is the cheapest resource

## Global cost curve of GHG abatement opportunities beyond business as usual



# What drives demand – really?

- Basic needs for survival and comfort or needs to be modern?
- Efficiency might not be enough - What about sufficiency?
- And if energy efficiency is
  - a) profitable,
  - b) effective and
  - c) wished for – what stops us?



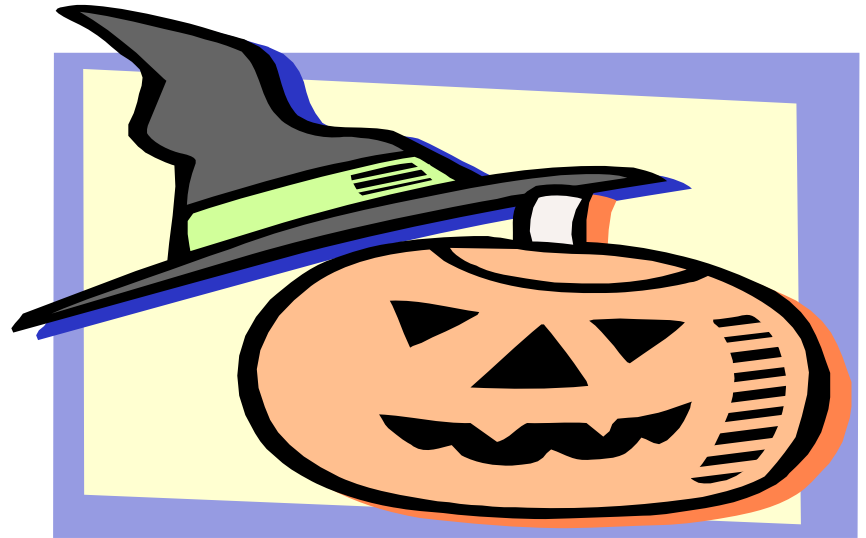
# Managing Demand

- What is energy efficiency?
- How far can we reach with policies and measures ?

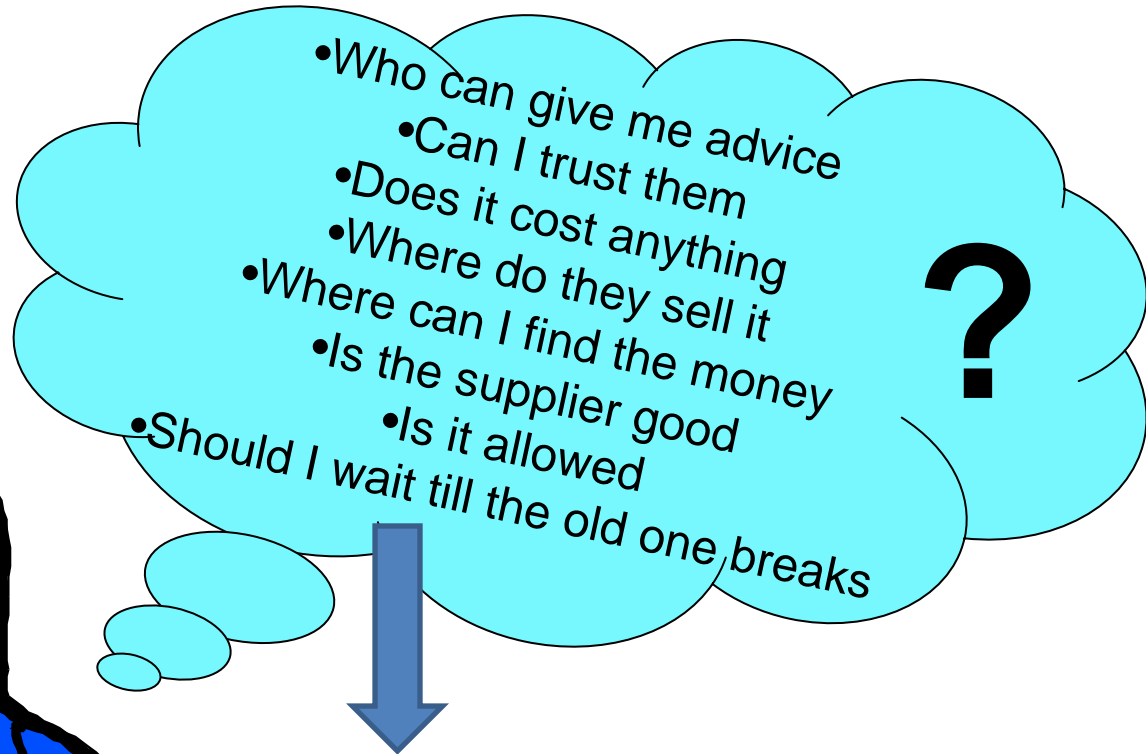
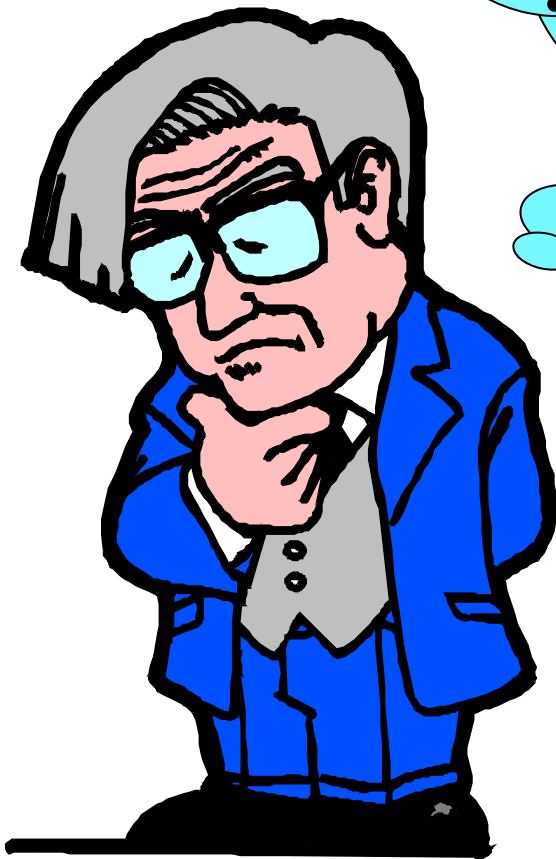


# The curse of the Demand Side (Energy Efficiency)

- Energy Efficiency is invisible
- Energy Efficiency is not a Product, but a characteristic (with products in comparison)
- Energy Efficiency is delivered in many small packages
- .....and on different occasions



# Barriers are images of troubled minds

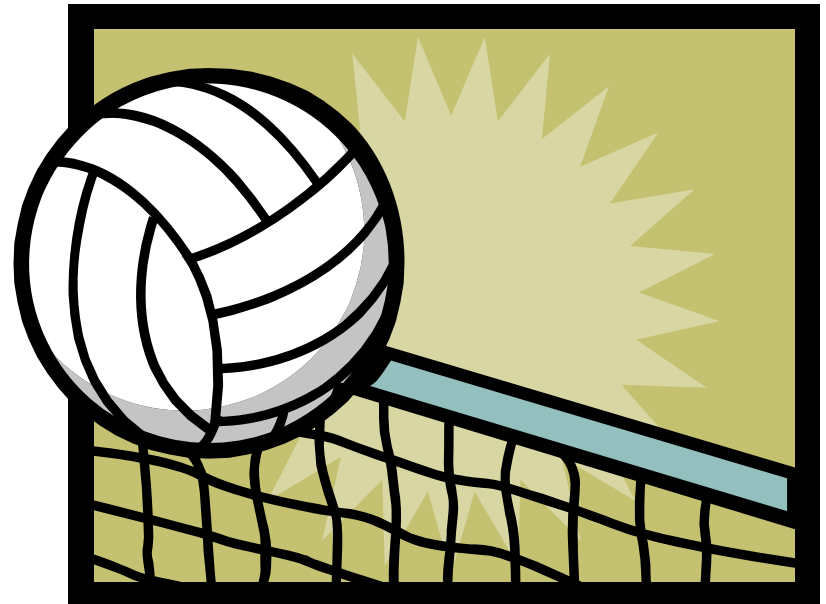


## BARRIERS

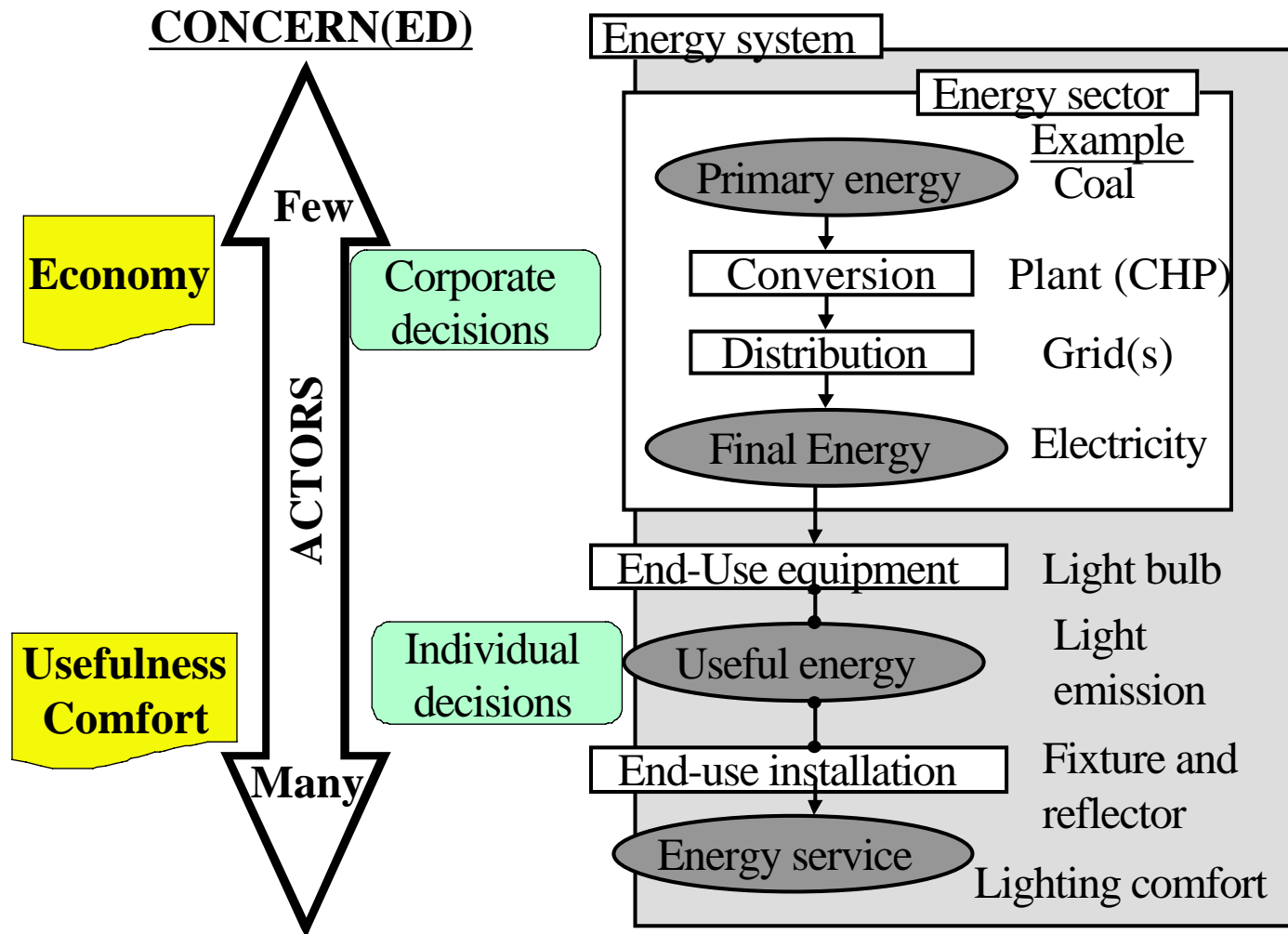
- **Information** (Availability, Reliability, Comparability)
- **Transaction Costs** (“Time is money”)
- **Financing** (High First Cost, Access to funds)
- **Price distortion** (Internalisation)
- **Market Organisation** (Split incentives, Calculation Methods)
- **Regulation** (Based on old technologies)

# Barriers as a metaphor can lead us astray.

- Once removed the road is clear....**well?**
- Lower barriers make the play easier... **probably yes**
- Barriers are real and well defined....**doubtful**
- There are means to address the barriers in an undisputed fashion....**not if they are undefined**

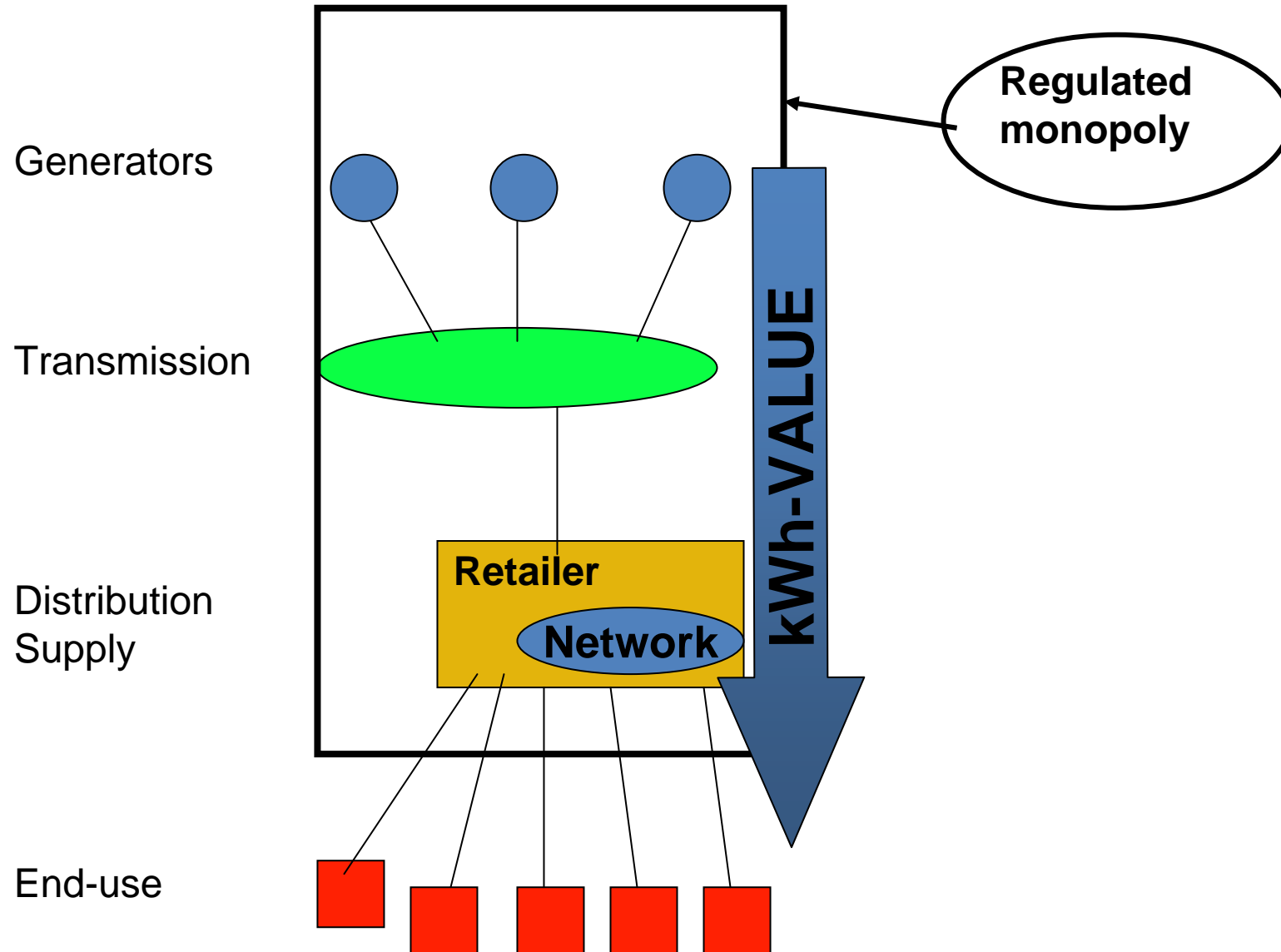


# Barriers are not the same to everyone

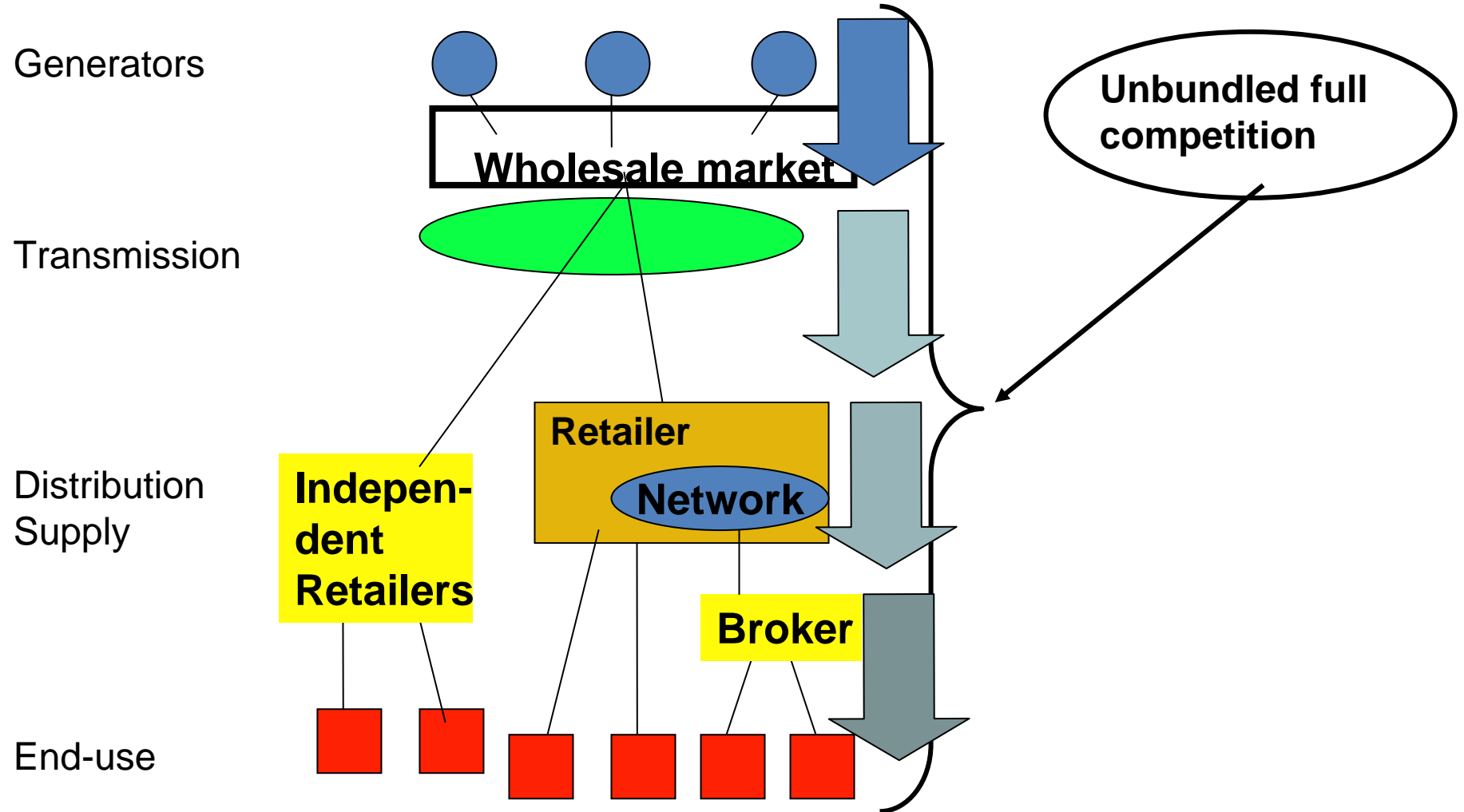




# The value chain used to be vertical..

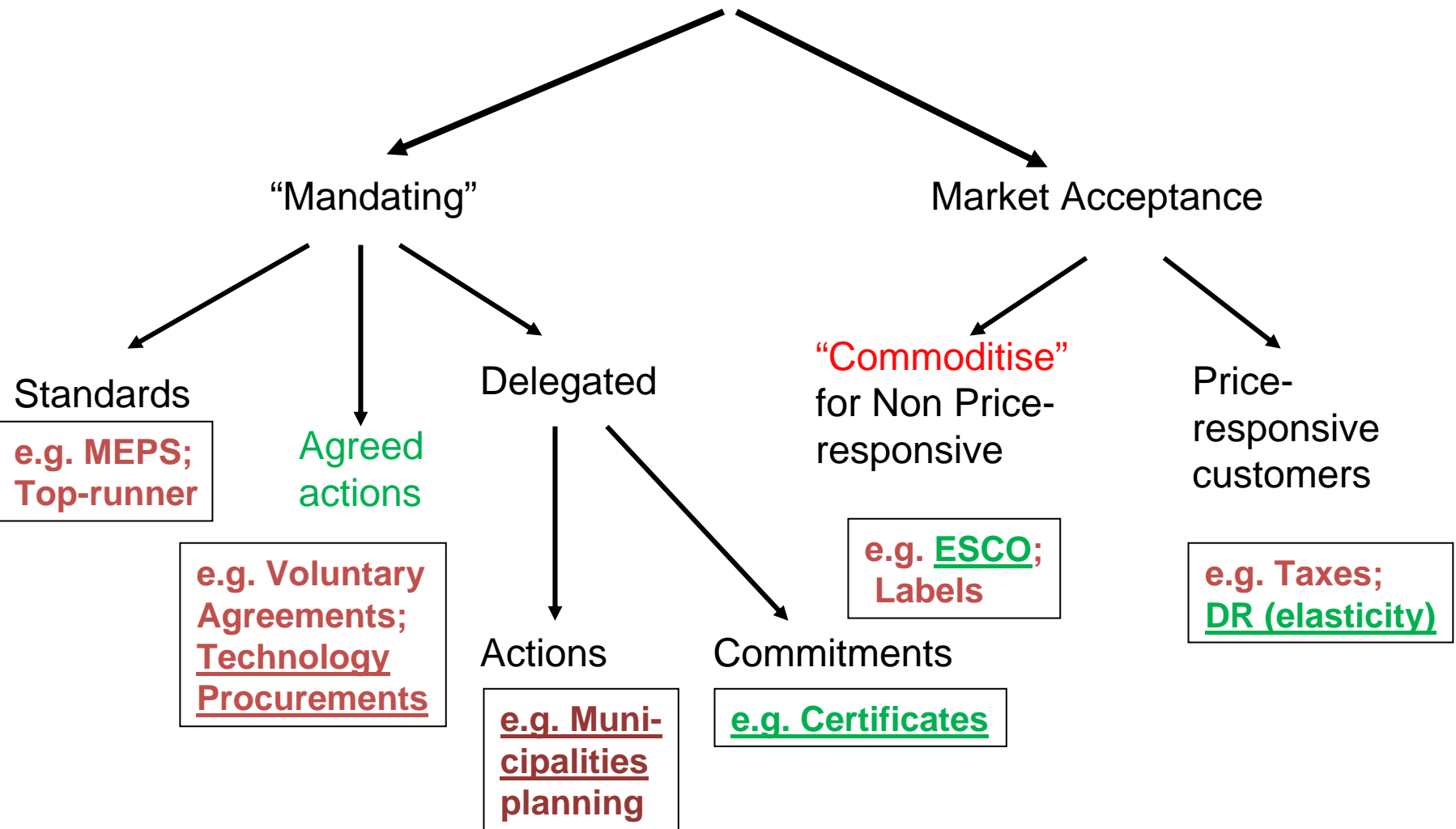


# ...but with liberalisation the value chain is fragmented



# But there are several means

## LARGE-SCALE ENERGY EFFICIENCY



# Technological changes

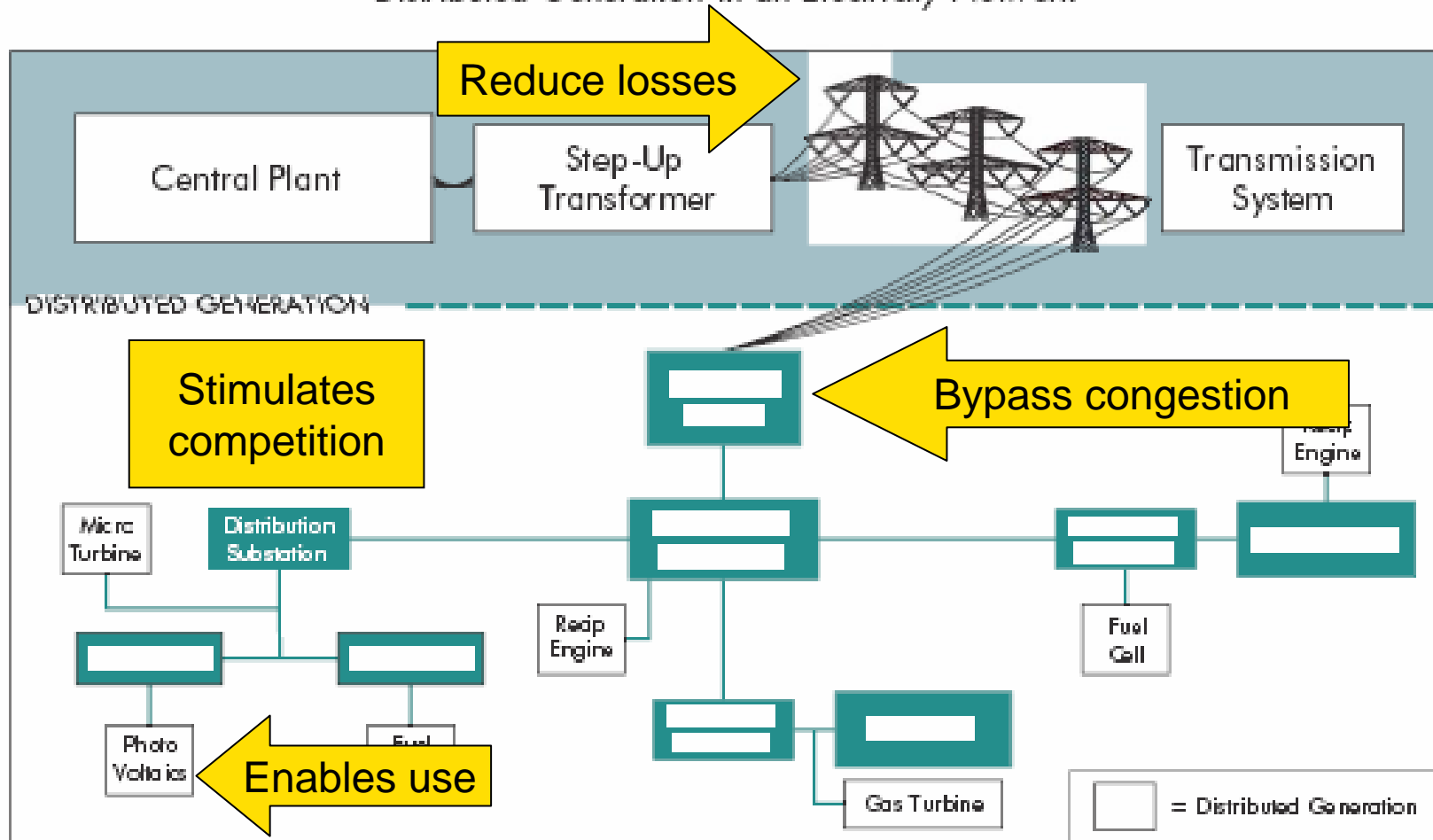
- Supply technology have new opportunities, smaller units and renewable fuels
- End-use and distribution technology will be more intelligent
- Supply to the vast masses of underprivileged will require technology development



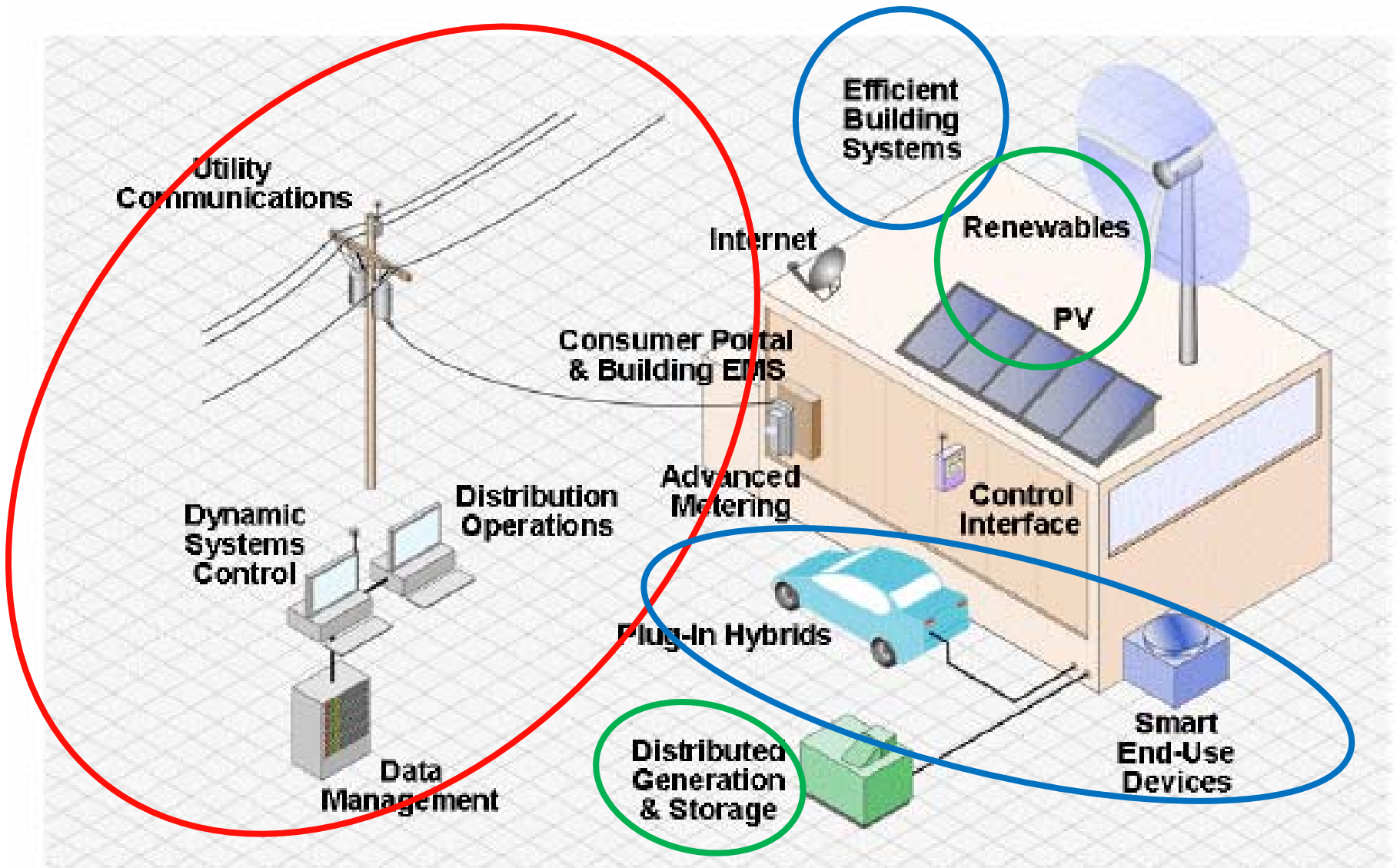
# New paradigms – Distributed Generation

Figure 1

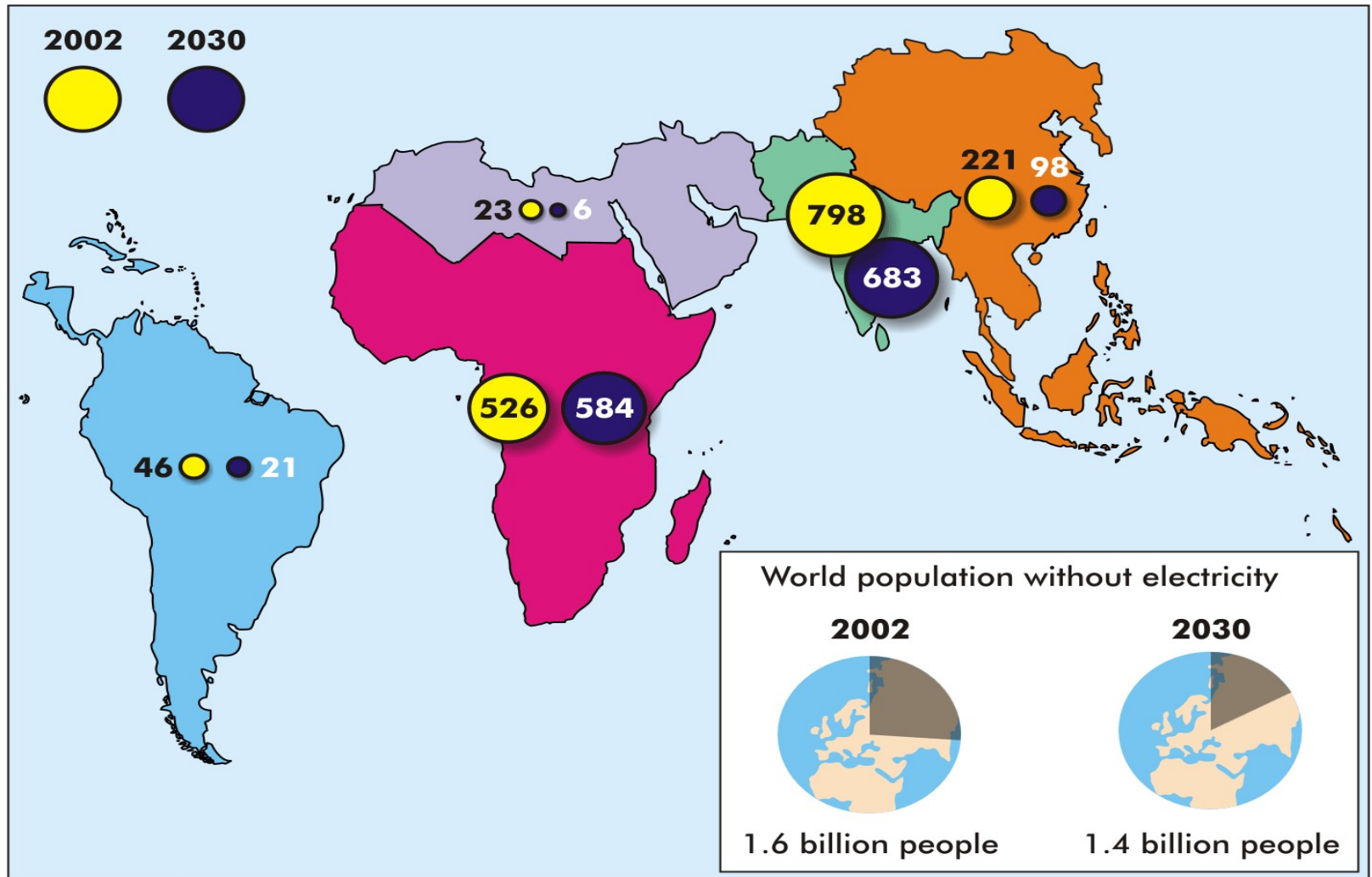
*Distributed Generation in an Electricity Network*



# New Technologies



# Map of Electricity Deprivation in the world



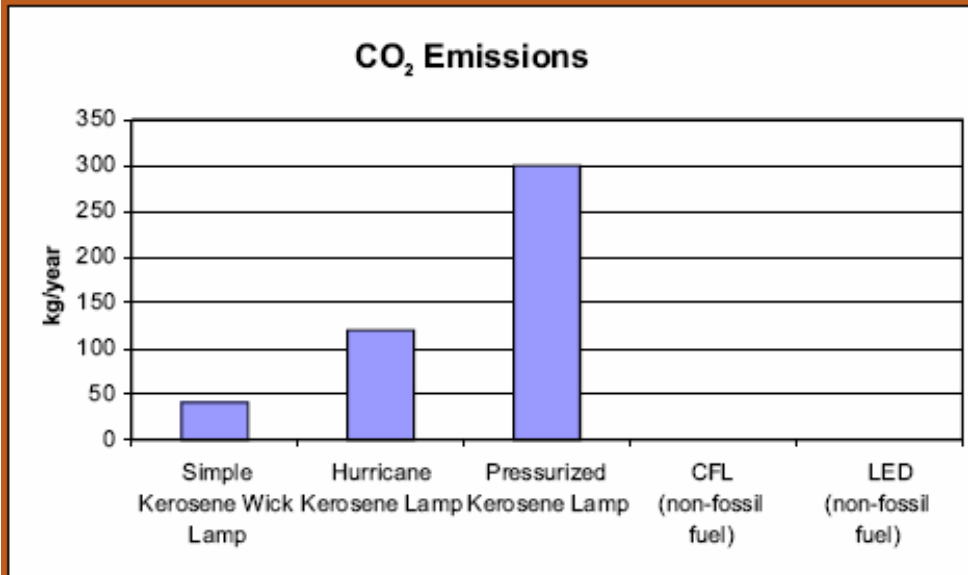
# Africa – The heart of darkness



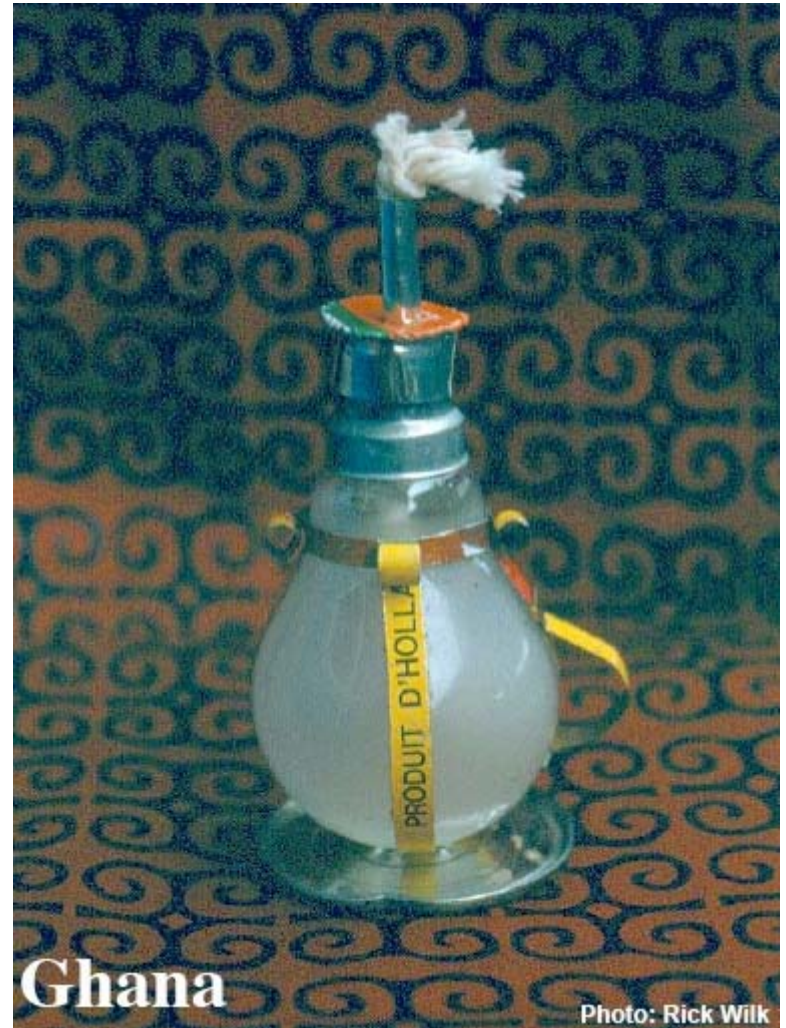


# Bad, expensive lighting keeps poor people in poverty

Carbon Dioxide Emissions by Lighting Source (kg/year)



Source: Jones, R. Jianping D., Zachary G., Ilan G. and Mills, E. Alternatives to Fuel-Based Lighting in Rural China, Proceedings of Right Light 6. May, 2005, China.



Ghana

Photo: Rick Wilk

[http://eetd.lbl.gov/EMills/PRESENTATIONS/Fuel\\_Based\\_LightingGROC.pdf](http://eetd.lbl.gov/EMills/PRESENTATIONS/Fuel_Based_LightingGROC.pdf)

<http://lightingafrica.org/brochures/BrochureEnglish.pdf>



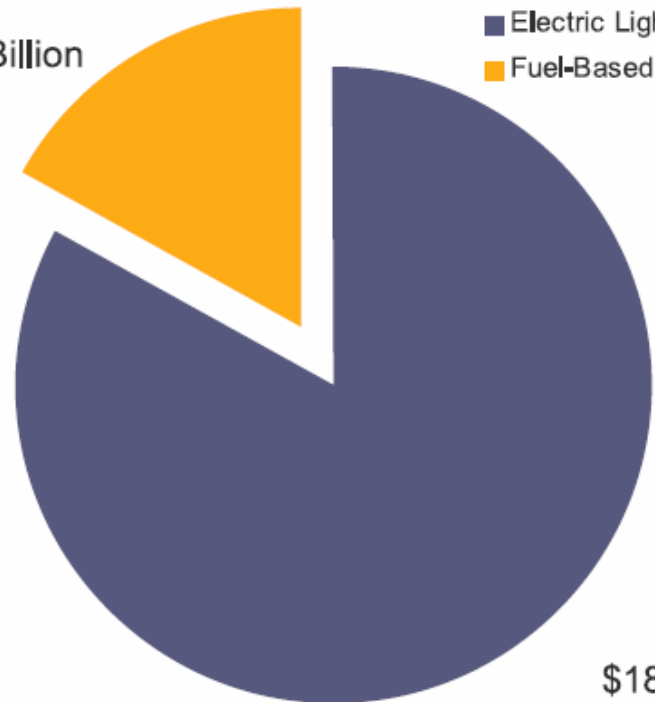
**MIGHTYLIGHT**

*Sunlight at Night*



### Global Annual Spending on Lighting

\$38 Billion

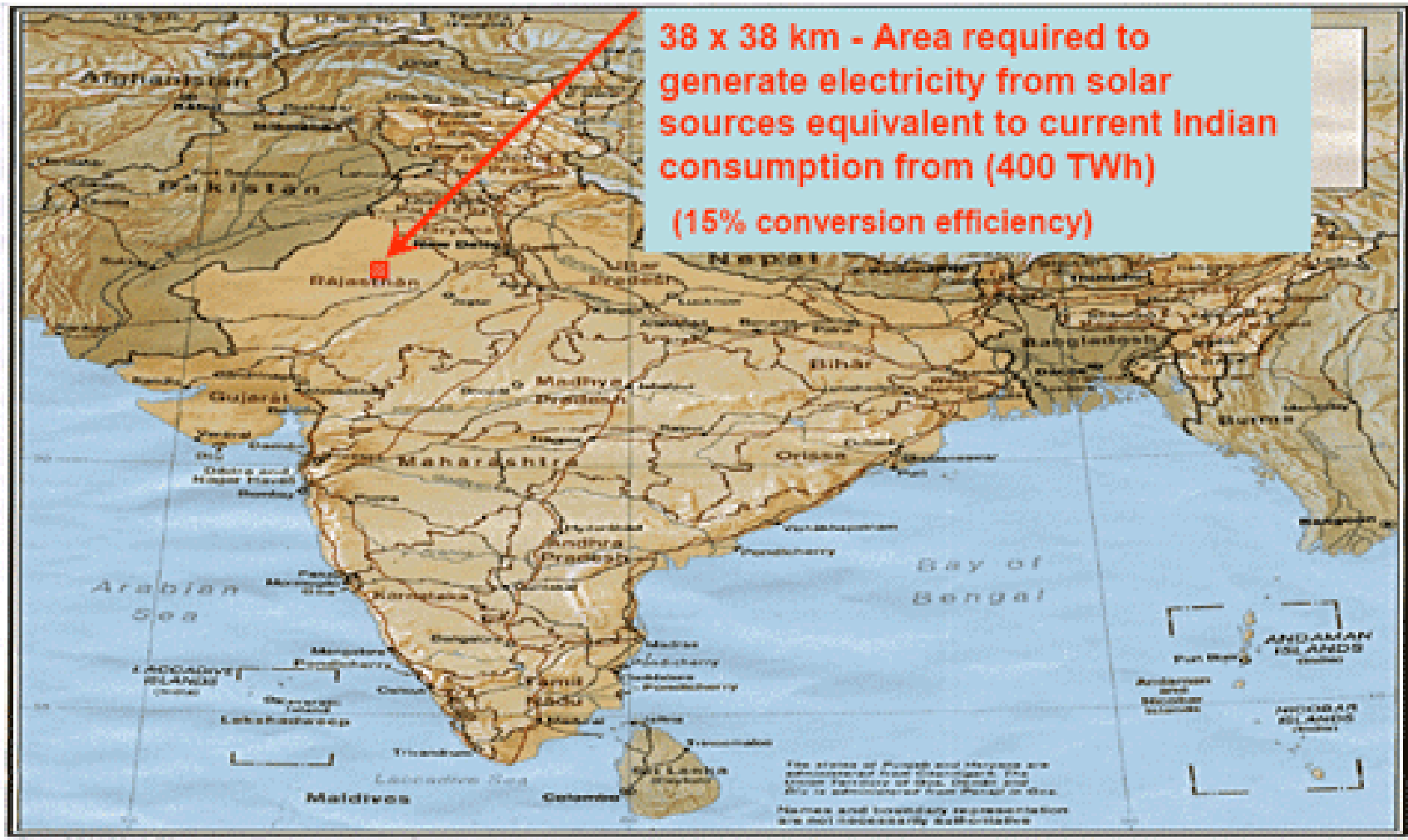


\$185 Billion

Sources: IFC Lighting the Bottom of the Pyramid; Evan Mills,

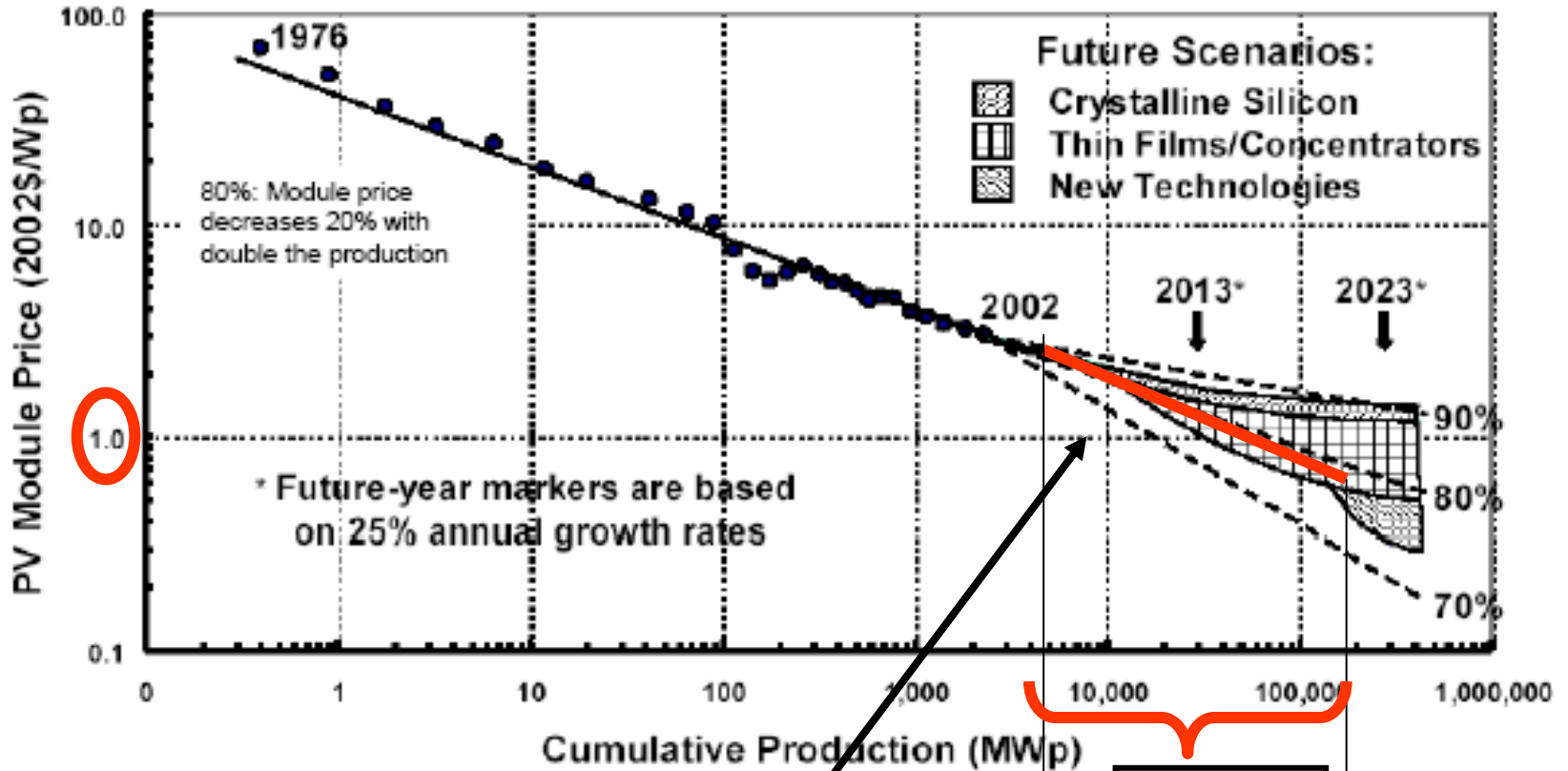


# A Solar powered India!



# Technology Learning Curves

Joint Research Centre

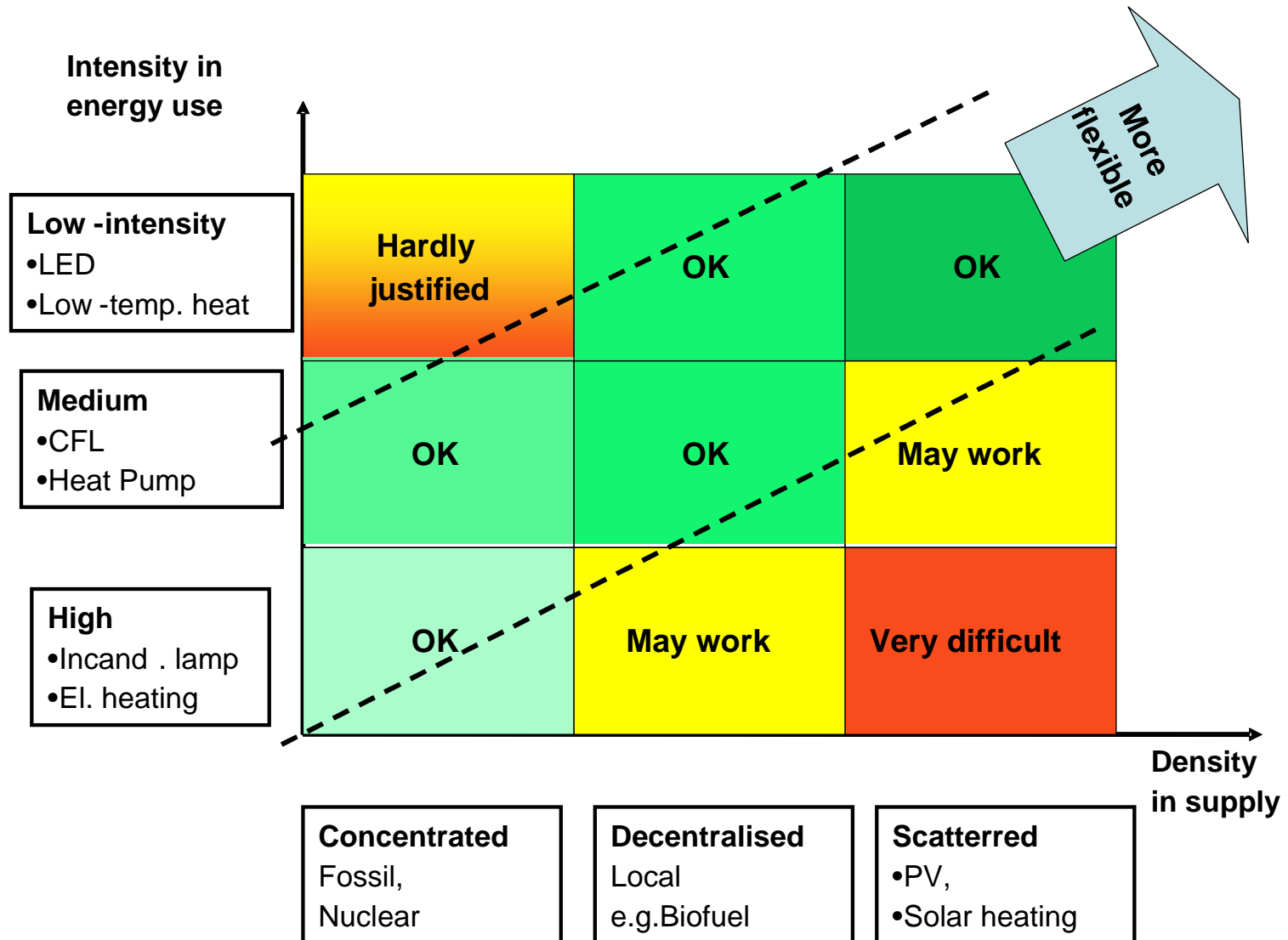


$$\text{price}[\$2002] = 37.644 * \text{Production}^{(-0.3243)}$$

**Break-even 1\$/W**

**INDIA  
150 GW**

# A sustainable system combines energy efficiency and renewable energy



# Energy Efficiency has multiple dividends

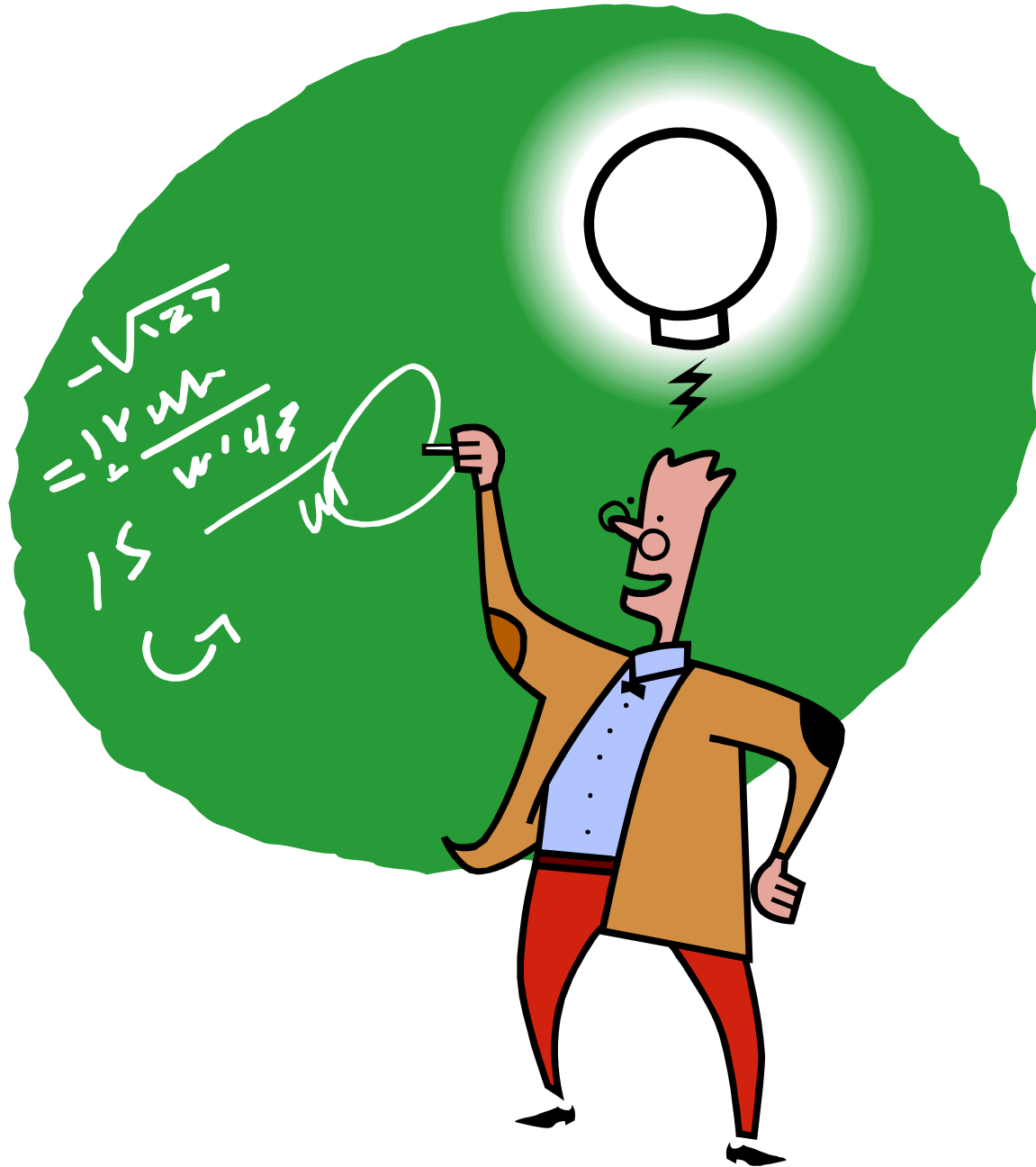


- **Cost**
- **Environment/Climate**
- Employment
- Industrial development
- Poverty alleviation
- Holds back prices in supply
- Reduces pressure on supply reserves

Is sustainable growth  
possible...



..without DSM  
and without  
global co-  
operation?



Thank  
you!